Federation for Environment, Climate and Technology

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Week of 26 Mar - 2 Apr 2021

CLIMATE MONITORING AND PREDICTION FOR SRI LANKA

By: Nipuni Alahakoon, Sanduni Gammanpila, Ushan Adithya, Azra Munas, Tuan Hadgie, Lareef Zubair and Michael Bell[1] (FECT and IRI[1])

HIGHLIGHTS

Rainfall Prediction

- *Showers of 75 mm expected in Southern, Western & Sabaragamuwa provinces during 24th - 30th Mar. A drop in rainfall over the rest of the country.*

Monitored Rainfalls

- *Dangerously heavy rainfall was experienced in Southern, Western & Sabaragamuwa provinces. Up to 153 mm max in Galle on 18th Mar.*

Monitored Wind

- *From 16th - 22nd March: up to 8 km/h easterly winds were experienced around along Sri Lanka.*

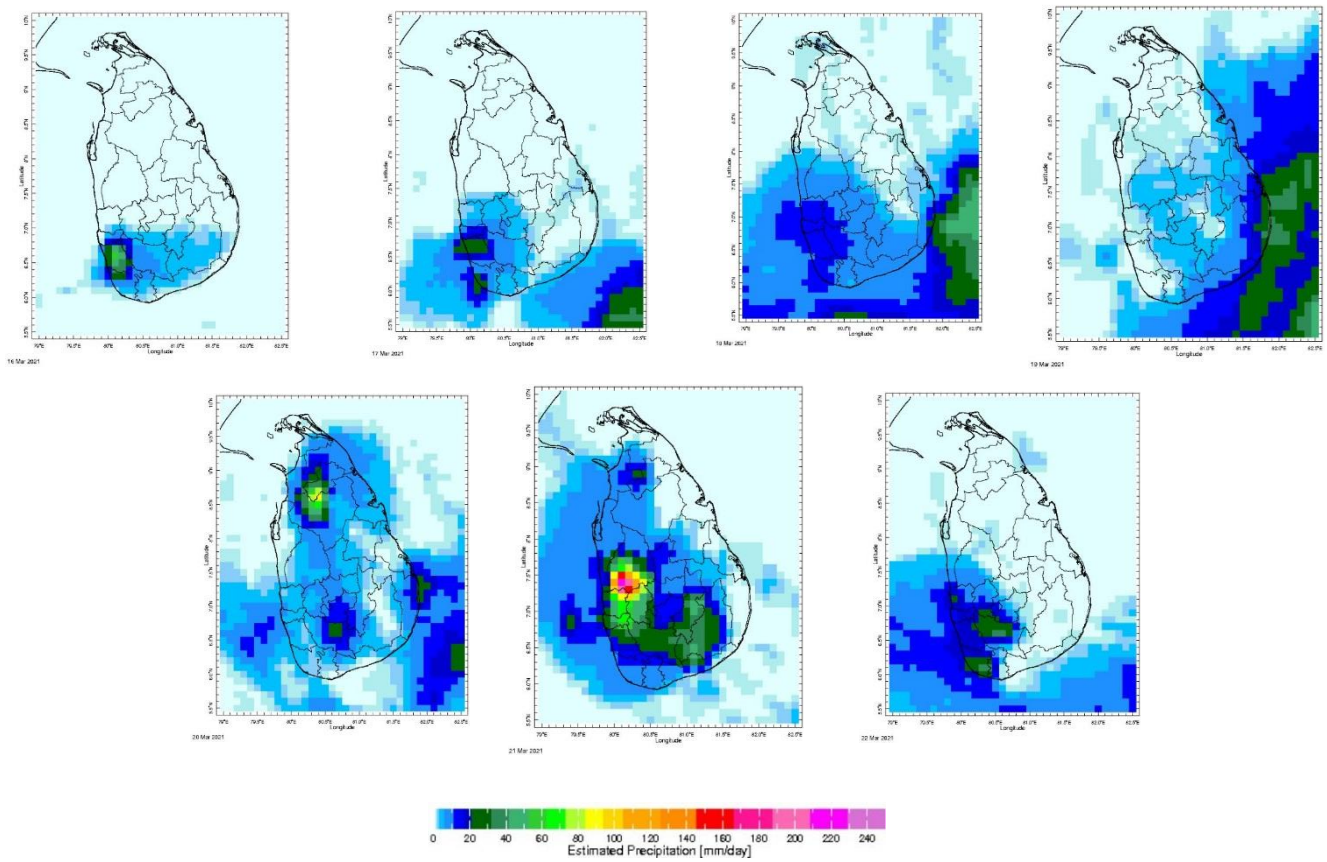
Monitored Sea Surface

- Sea surface temperature was observed Neutral around along the Sri Lanka

Monitoring

Rainfall

Daily Estimates for Rainfall from 16th – 22nd March



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Total Rainfall for the Past Week

The RFE 2.0 tool shows 7-day total Cumulative rainfall by Districts:

Rainfall	Districts
200 – 300 mm	Kurunegala, Gampaha
150 – 200 mm	Kegalle
100 – 150 mm	Puttalam, Ratnapura, Colombo, Kalutara
75 – 100 mm	Vavuniya, Anuradhapura, Kandy, Nuwara Eliya, Badulla, Moneragala, Galle, Hambantota
50 – 75 mm	Mannar, Batticaloa, Ampara, Matara
25 – 50 mm	Mullaitivu, Matale
10 – 25 mm	Kilinochchi, Polonnaruwa, Trincomalee

There was no rainfall throughout the week in the remaining district.

Weekly Rainfall Anomalies by Districts:

Rainfall Excess

Rainfall	Districts
200 – 300 mm	Kurunegala
100 – 200 mm	Puttalam, Gampaha, Colombo, Kegalle
50 – 100 mm	Vavuniya, Anuradhapura, Ampara, Kandy, Nuwara Eliya, Badulla, Moneragala, Ratnapura, Kalutara, Galle, Hambantota
25 – 50 mm	Mannar, Mullaitivu, Batticaloa, Matara
10 – 25 mm	Matale

There was no rainfall throughout the week in the remaining districts.

Monthly Monitoring

During early and middle March, Dekadal Rainfall (mm/day) by Districts:

1st– 10th March:

Rainfall	Districts
18 mm	Nuwara Eliya, Gampaha, Colombo, Kalutara, Kegalle, Ratnapura, Kurunegala
16 mm	Galle, Badulla, Moneragala
14 mm	Matara
12 mm	Hambantota, Kandy
10 mm	Puttalam
8 mm	Matale
6 mm	Mannar, Anuradhapura, Polonnaruwa, Ampara
4 mm	Trincomalee, Batticaloa
2 mm	Jaffna, Kilinochchi, Mullaitivu, Vavuniya

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11th– 20th March:

Rainfall	Districts
12 mm	Kalutara
8 mm	Galle, Gampaha, Colombo, Ratnapura, Vavuniya, Anuradhapura, Ampara
6 mm	Hambantota, Kegalle, Nuwara Eliya, Puttalam, Kurunegala
4 mm	Matara, Moneragala, Badulla, Kandy, Mannar, Batticaloa
2 mm	Matale, Kilinochchi, Mullaitivu, Polonnaruwa, Trincomalee, Jaffna

Ocean State *(Text Courtesy IRI)*

Pacific sea state: March 17, 2021

Equatorial SSTs were mostly below average from the west-central to the eastern Pacific Ocean in mid-March and most key atmospheric variables were either ENSO –Neutral or consistent with continued La Niña conditions. A large majority of the model forecasts predict SSTs to be cooler than the threshold of La Niña SST conditions through the winter, dissipating during spring.

Indian Ocean State

Sea surface temperature was observed near neutral around along the Sri Lanka.

Predictions

Rainfall

14-day prediction: NOAA NCEP models

From 24th – 30th March:

Total rainfall by Provinces:

Rainfall	Provinces
75 mm	Southern, Western, Sabaragamuwa
65 mm	Uva, Central, Eastern
55 mm	North Western
35 mm	North Central
25 mm	Northern

From 31st Mar – 6th April:

Total rainfall by Provinces:

Rainfall	Provinces
35 mm	Western, Sabaragamuwa
25 mm	Southern, Uva
15 mm	North Western, Eastern, Central

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MJO based OLR predictions

For the next 15 days:

MJO shall significantly enhanced the rainfall during 23rd Mar– 1st Apr and neutral during 2nd– 6th Apr.

Interpretation

Monitoring

Rainfall: During the last two weeks, there had been high rainfall over the following provinces: Southern, Sabaragamuwa, Western and North Western

Wind: As is typical for March the Northeasterly winds prevailed in the sea area and around the island.

Temperatures: The temperature anomalies were slightly above normal for the North Western & Sabaragamuwa provinces the last – driven by the warm SST's.

Predictions

Rainfall: During the next week (27th – 31st March), showers is predicted for the Sothern, Western and Sabaragamuwa region. A drop in rainfall is predicted over the rest of the country.

Temperatures: The temperature remains slightly above normal for March.

Teleconnections:

- MJO shall significantly enhanced the rainfall during 23rd Mar– 1st Apr and neutral during 2nd– 6th Apr.
- La Nina - The SST forecast is for La Nina conditions to continue through April weakening through June. So, the La Niña is expected to be moderate to strong in coming seasons.

Tropical Climate Guarantee, Federation of Environment, Climate and Technology, Columbia University Water Center, [1] International Research Institute for Climate and Society, , Earth Institute at Columbia University, New York.

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Weekly Climate Bulletin for Sri Lanka

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   c. MJO Related OLR Forecast
   d. Weekly Temperature Forecast
   e. Weekly Wind Forecast
   f. Seasonal Predictions from IRI

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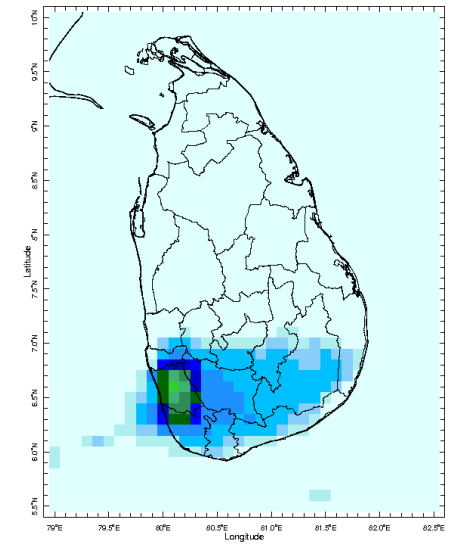
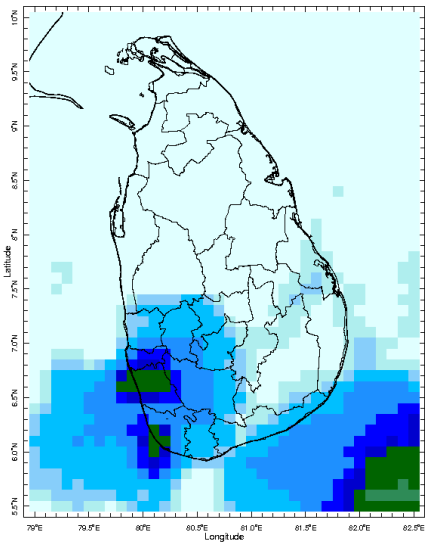
MONITORING

Daily Rainfall Monitoring

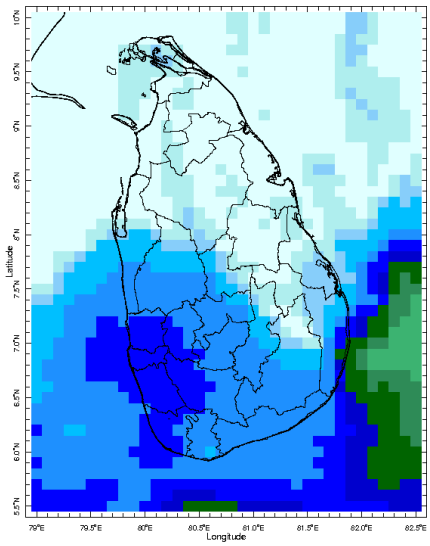
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



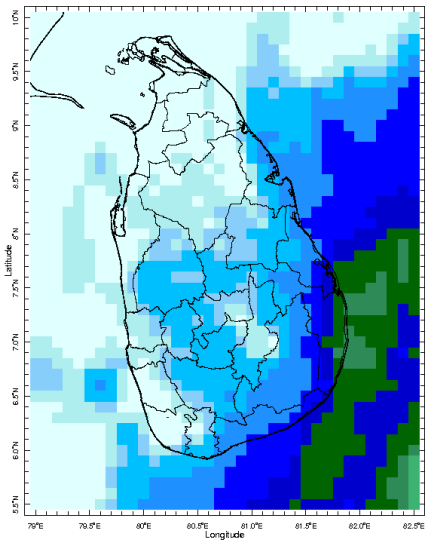
16 Mar 2021



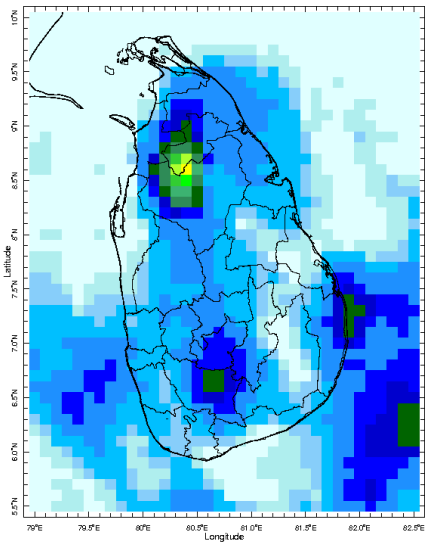
17 Mar 2021



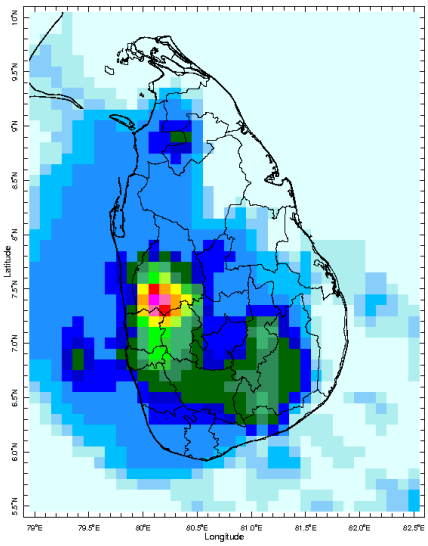
18 Mar 2021



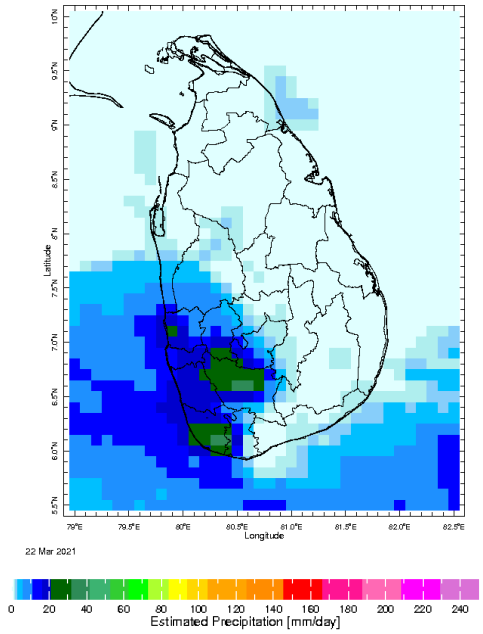
19 Mar 2021



20 Mar 2021

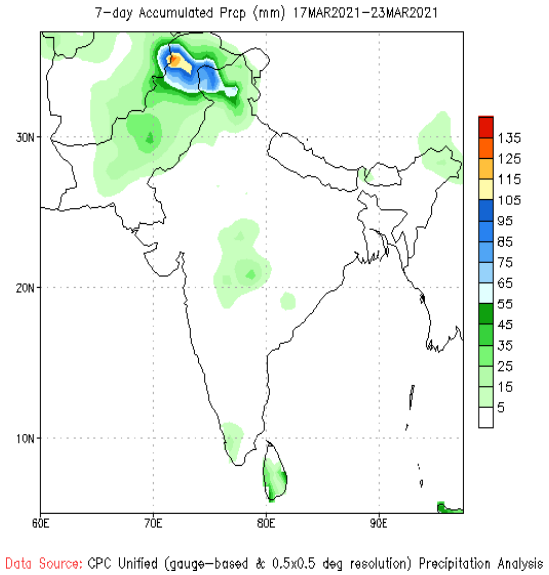


21 Mar 2021

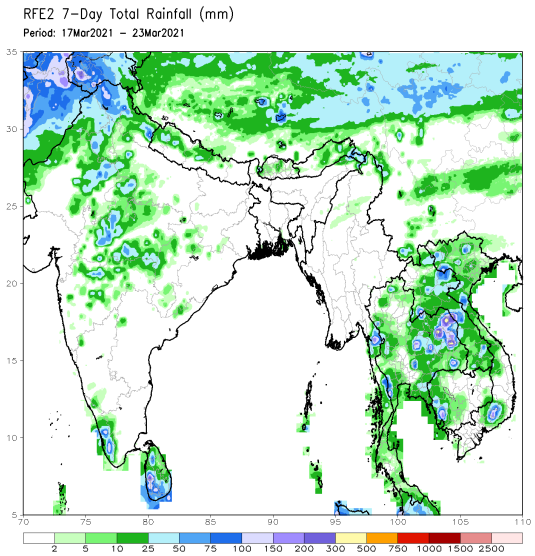


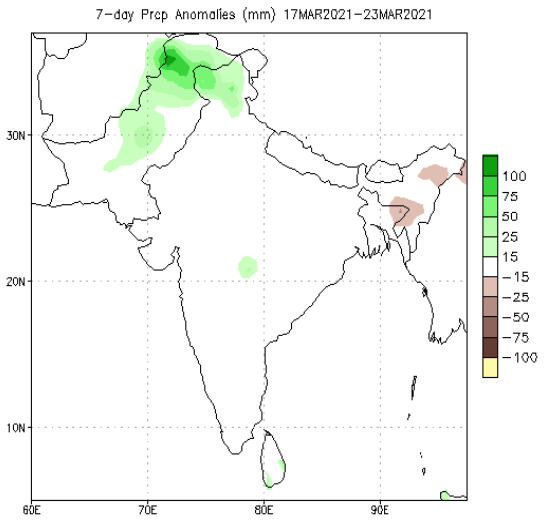
Weekly Rainfall Monitoring

The following figures show the total satellite observed rainfall in the last week in Sri Lanka. The figure in the left is the total 7-day rainfall from NOAA Climate Prediction Center (CPC) Unified Precipitation Analysis and the figure in the right is the total 7-day rainfall from CPC RFE 2.0 Satellite Rainfall Estimates. The bottom two figures are the respective anomalies.

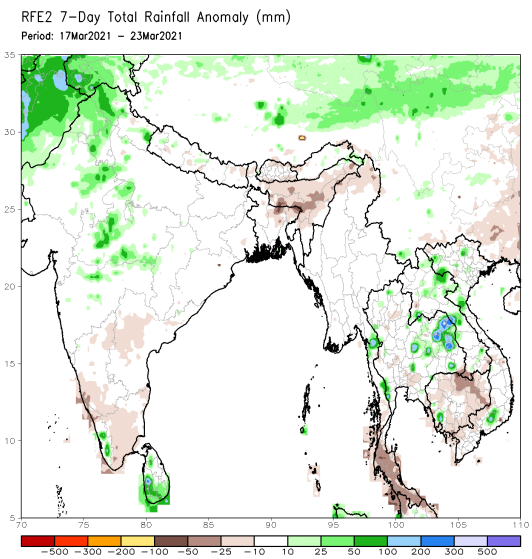


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis



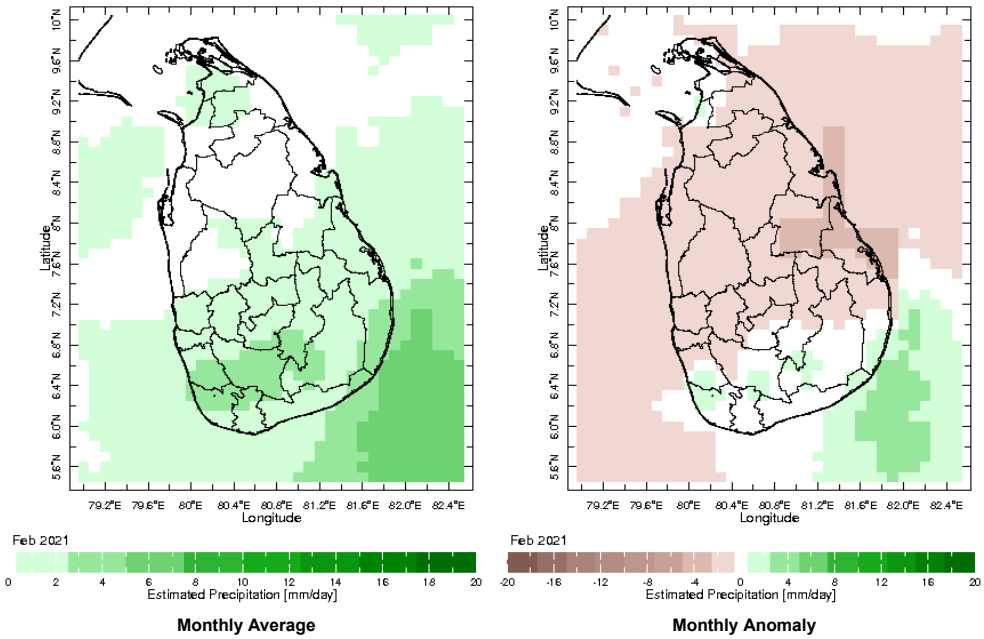


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis
Climatology (1981-2010)



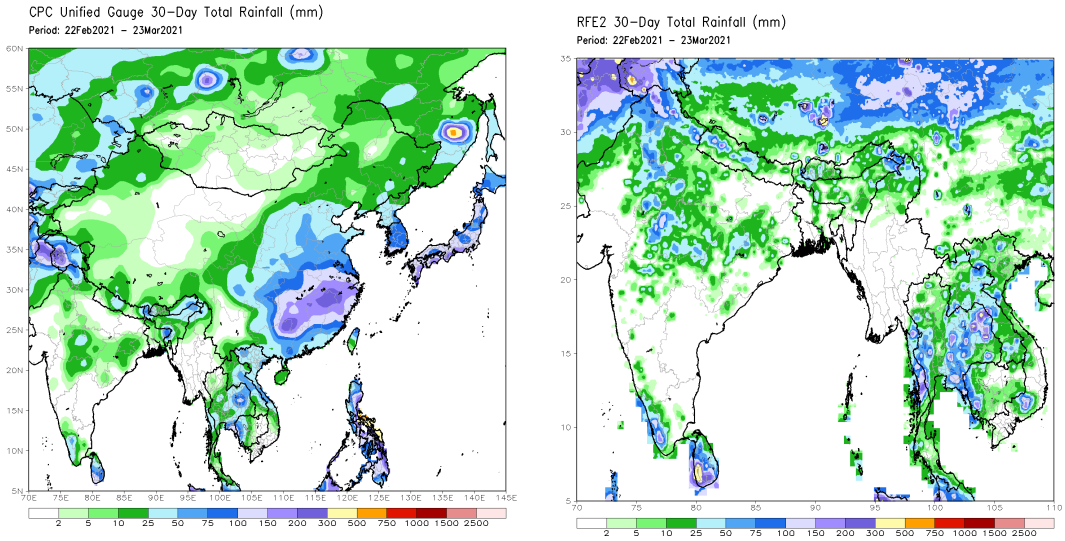
Monthly Rainfall Monitoring

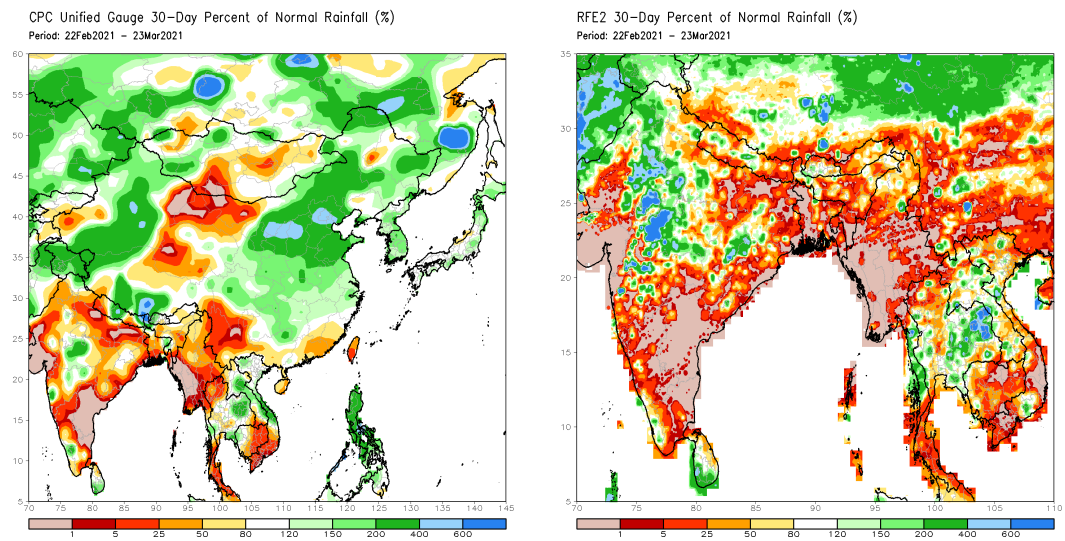
The figure in the left shows the average observed rainfall in the previous month. The rainfall anomaly in the previous month is shown in the figure to the right. The brown color in the anomaly figure shows places which received less rainfall than the historical average while the green color shows places with above average rainfall. Darker shades show higher magnitudes in rainfall



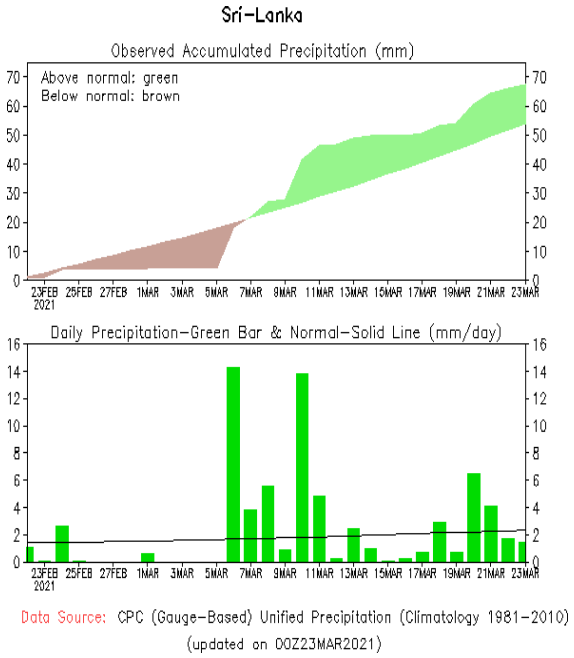
Monthly Average **Monthly Anomaly**

The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in the past 30 days compared to normal rainfall in this period.

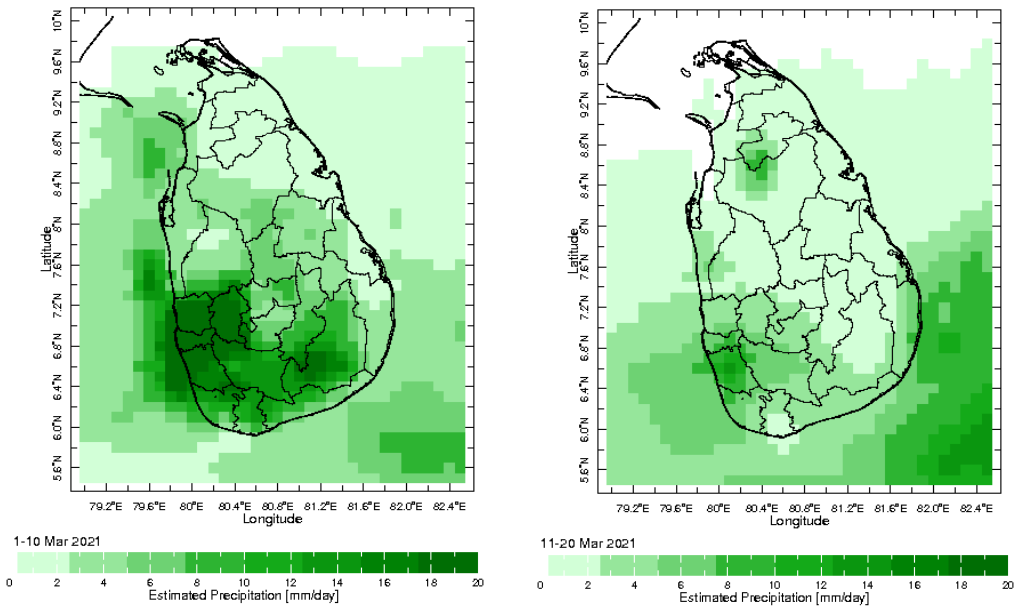




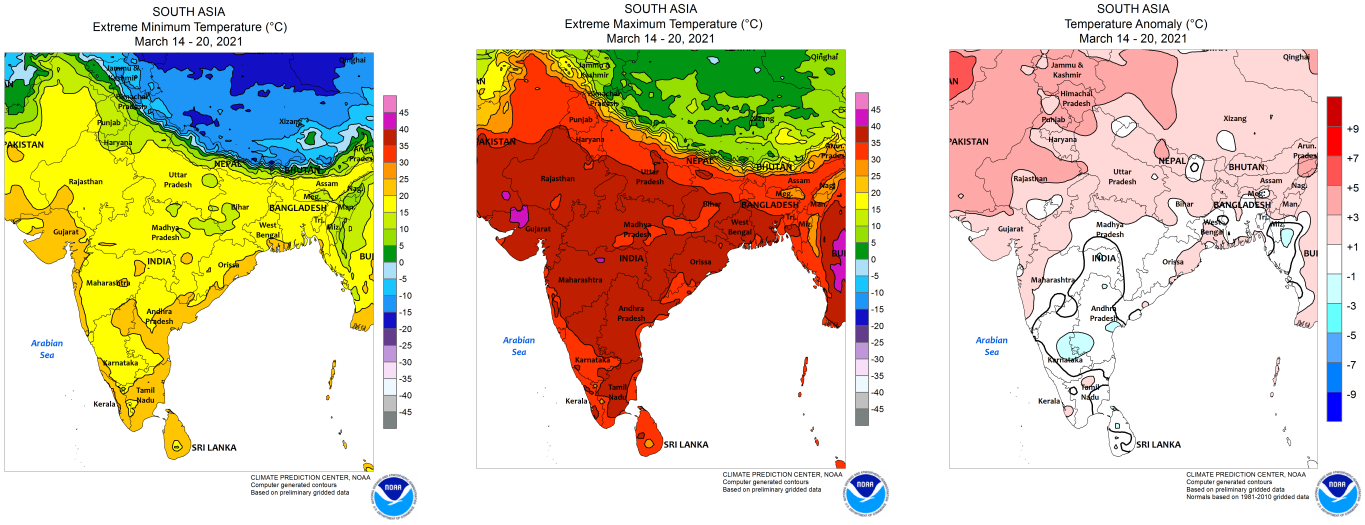
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



Dekadal (10 Day) Satellite Derived Rainfall Estimates

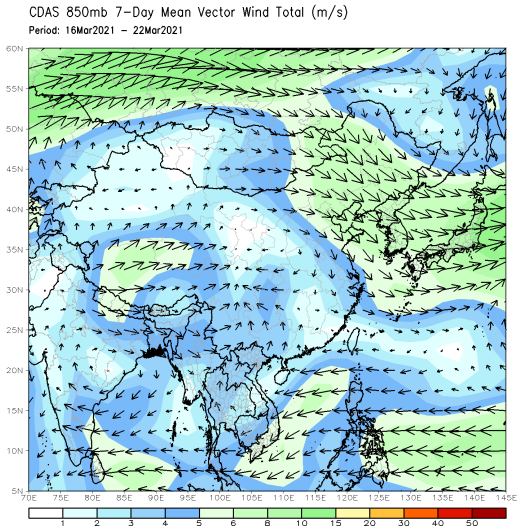


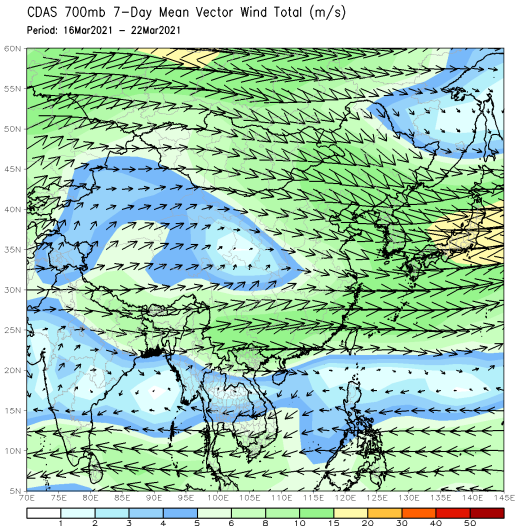
Weekly Temperature Monitoring



Weekly Wind Monitoring

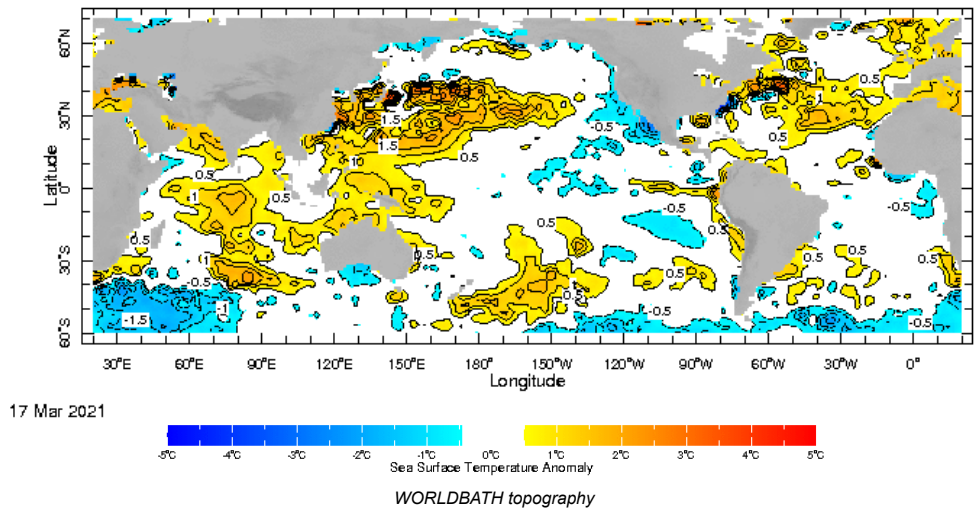
The following figures show the mean vector wind total of the past 7 days near Sri Lanka at two levels. The figure on the left shows 850 mb (~1500 m) level and the figure on the right shows 700 mb (~3000 m) level.



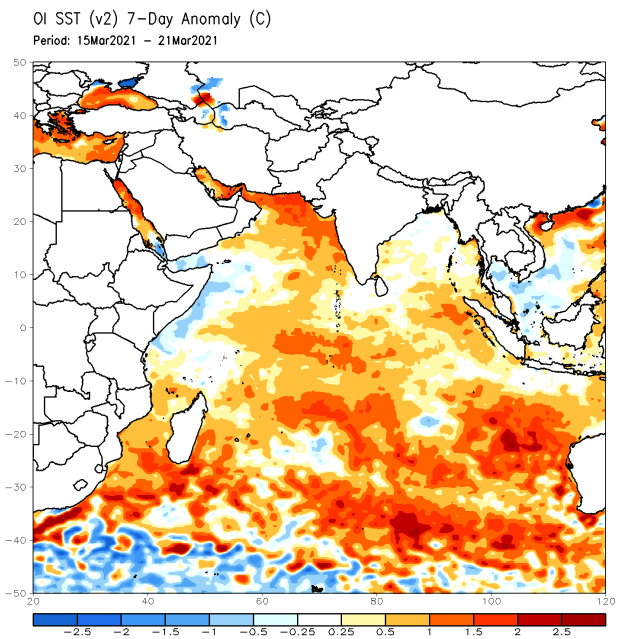


Weekly Average SST Anomalies

Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP

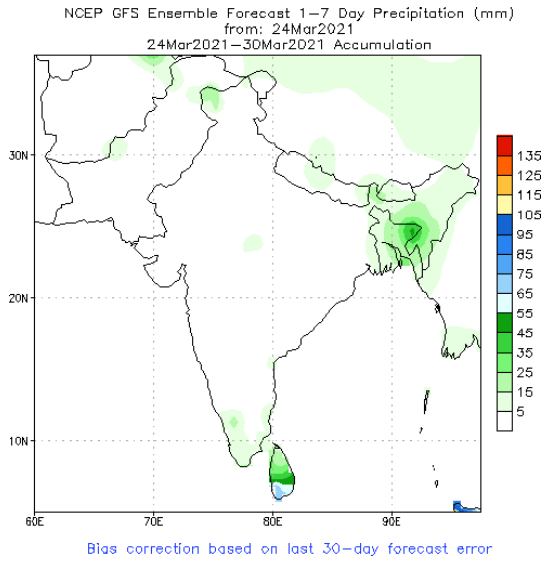


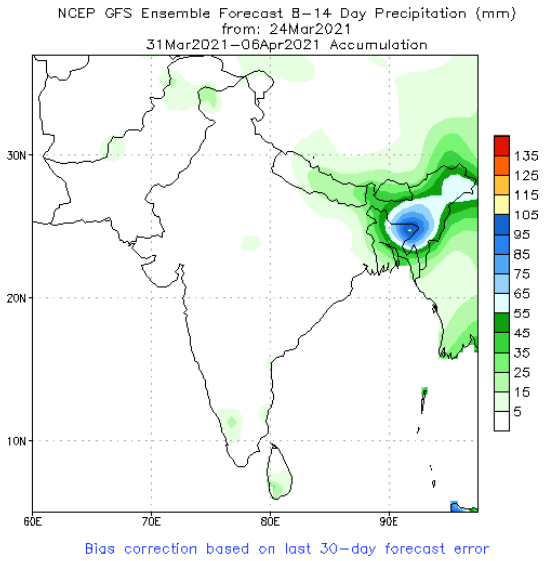
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC



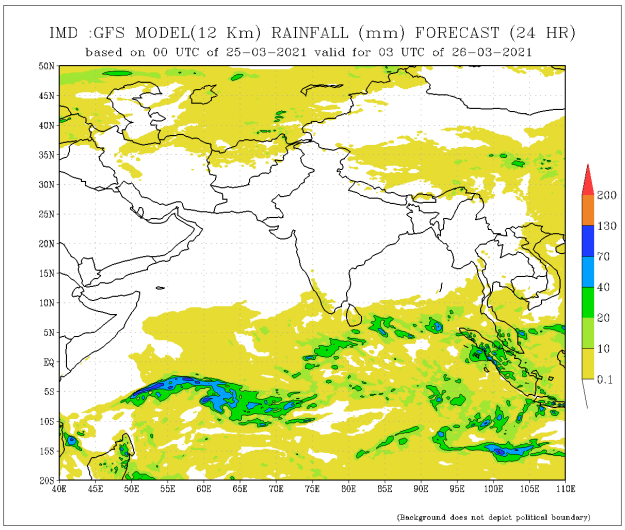
PREDICTIONS

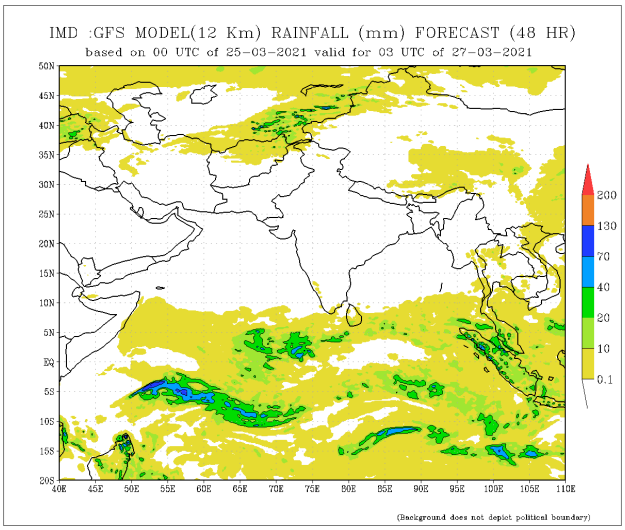
NCEP GFS 1- 14 Day prediction

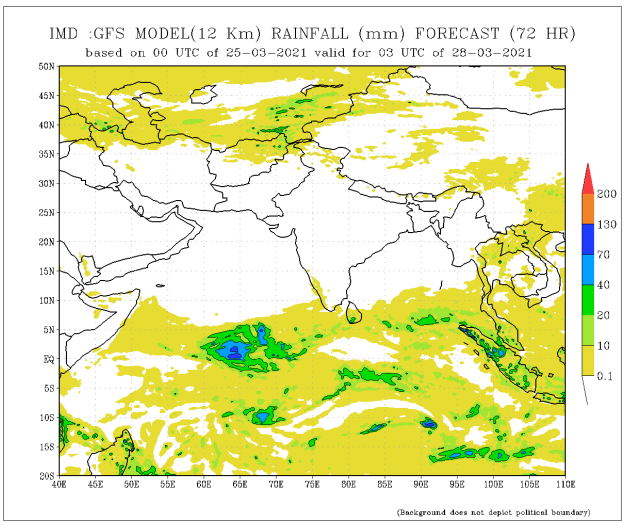


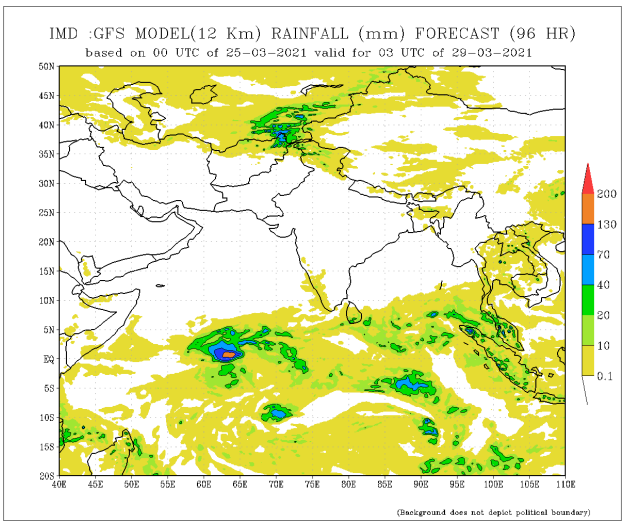


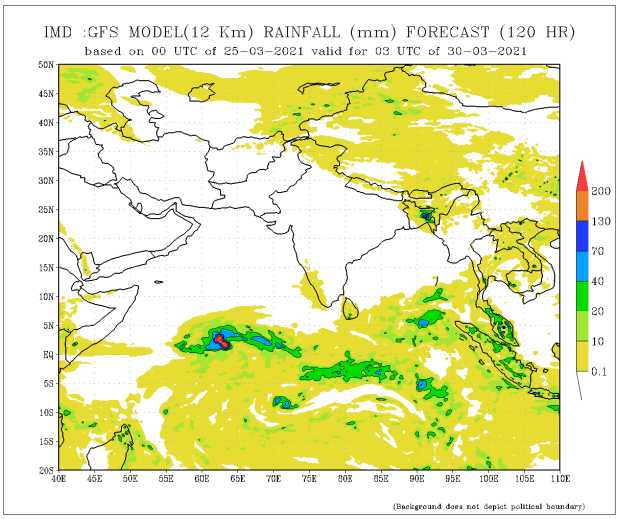
IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India

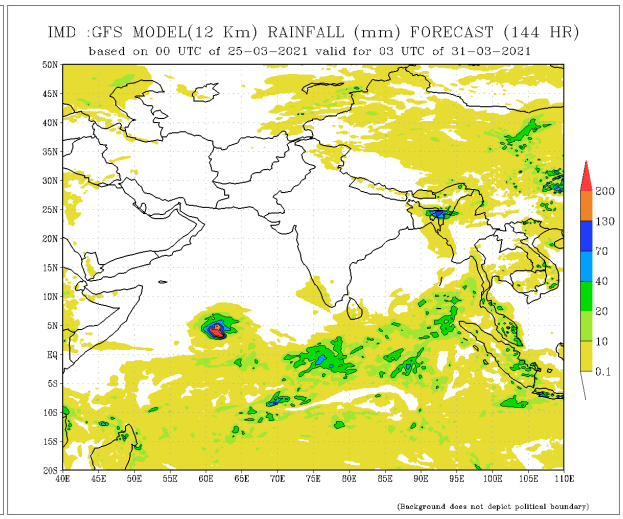


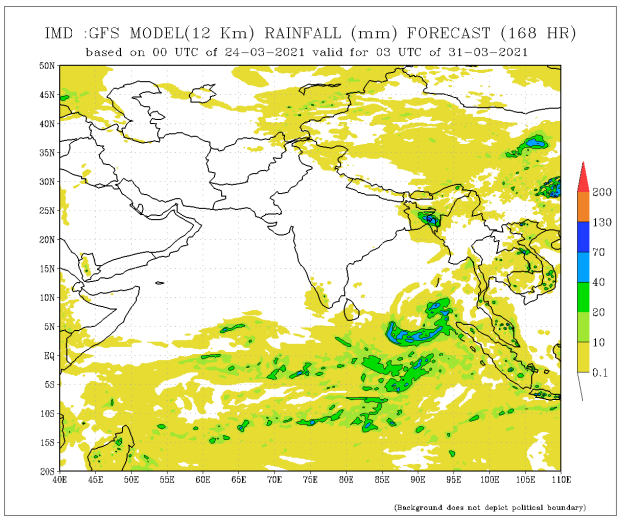






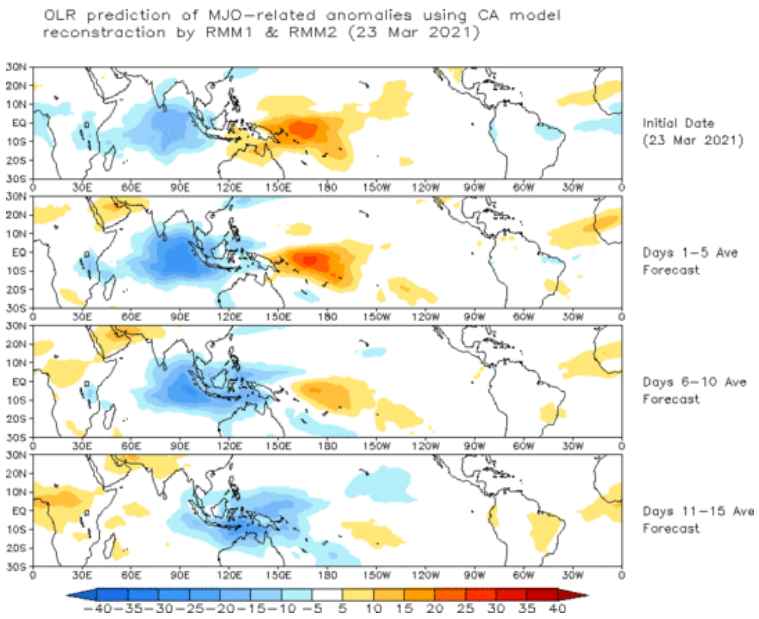






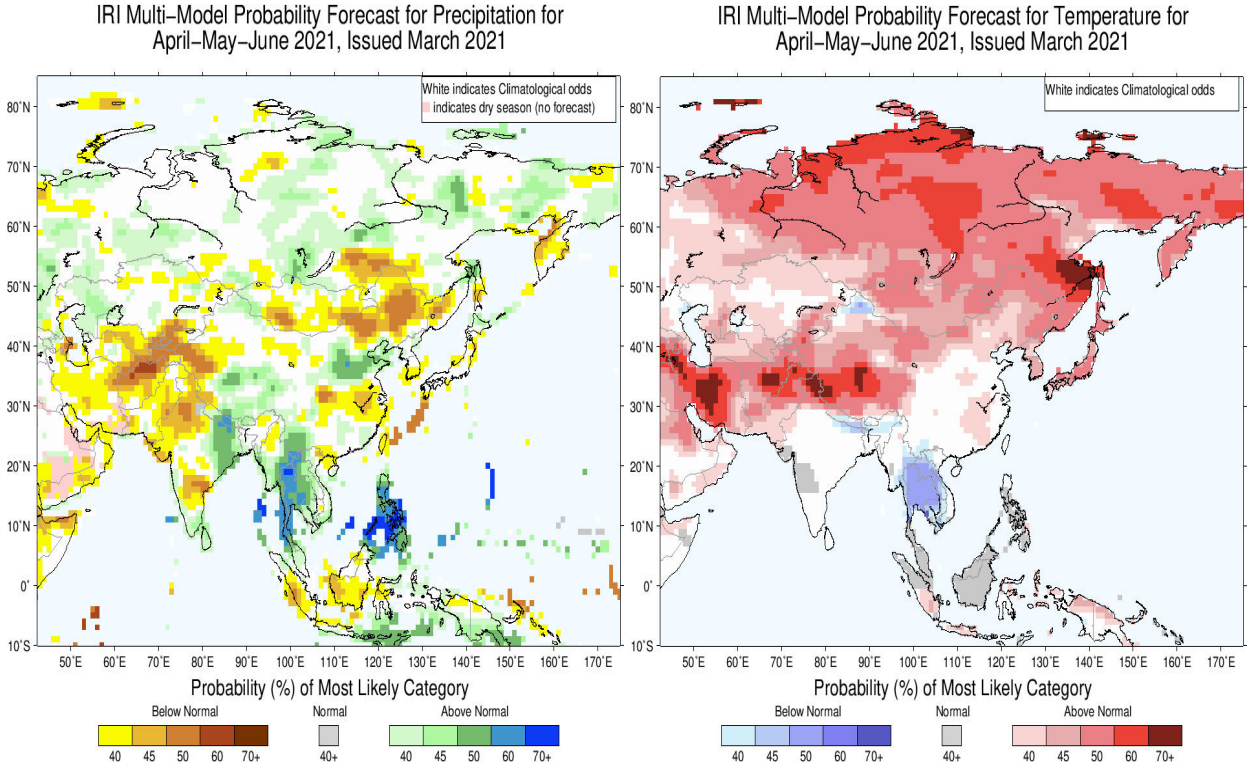
Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. This can be used to identify convective rain clouds based on the MJO phase. Violet and Blue shading indicates enhanced tropical weather and Orange shading indicates suppressed conditions. The following figure shows the forecasts of MJO associated anomolous OLR for the next 15 days from the Constructed Analogue (CA) model forecasts.



Seasonal Rainfall and Temperature Forecast

Following is the latest seasonal precipitation and temperature prediction for the next 3 months by the IRI. The color shading indicates the probability of the most dominant tercile -- that is, the tercile having the highest forecast probability. The color bar alongside the map defines these dominant tercile probability levels. The upper side of the color bar shows the colors used for increasingly strong probabilities when the dominant tercile is the above-normal tercile, while the lower side shows likewise for the below-normal tercile. The gray color indicates an enhanced probability for the near-normal tercile (nearly always limited to 40%).



Precipitation Forecast **Temperature Forecast**

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